Claims:

1. Motion sensor (10, 20, 40) for measuring a patients activity level comprising a fluid-tight, bio-compatible housing (11, 41), a plurality of electrodes (12, 42) being coupled to the housing, the housing comprising a fluid **characterised by** that the fluid comprises at least one anisotropic molecule, the anisotropic properties of which are changed in relation to the motion of the fluid, whereby the state of the anisotropic molecules of the fluid is detectable by the electrodes.
2. Motion sensor according to claim 1, which motion sensor is implantable
3. Motion sensor according to claim 1 or 2, wherein the anisotropic molecule is a liquid crystalline polymer (LCP).
4. Motion sensor according to claim 3, wherein the LCP is poly (p-phenylene) having a degree of polymerisation (n) higher than or equal to 10.
5. Motion sensor according to any one of the preceding claims, whereby the anisotropic molecule comprises an electrically detectable part.
6. Motion sensor according to claim 5, whereby the electrically detectable part is covalently coupled to the anisotropic molecule.
7. Motion sensor according to claim 5 or 6, wherein the electrically detectable part is a magnetic nanoparticle, a zwitterionic pair or a charge separated ion-pair.
8. Motion sensor according to claim 7, whereby the magnetic nanoparticle is an iron oxide nanoparticle.
9. Motion sensor according to any one of the preceding claims, whereby an external magnetic field (14, 15) is applied to the housing.
10. Motion sensor according to any one of claim 1-8, whereby an external electrostatic field (44, 45) is applied to the housing.
11. Motion sensor according to any of the preceding claims, whereby the state of the anisotropic molecule is monitored by measuring the capacitance in the fluid.
12. Motion sensor according to claim 1-10, whereby the state of the anisotropic molecule is monitored by measuring the resistance in the fluid.

13. Motion sensor according to claim 11, whereby a pair of capacitance electrodes (12, 13) is positioned perpendicular to the applied magnetic field (14, 15).

14. Motion sensor of claim according to any one of claim 1-13, whereby the housing comprises means for creating shear forces in the anisotropic fluid.

15. Electrically detectable anisotropic fluid comprising a liquid crystalline polymer (LCP) as the anisotropic fluid, which LCP is covalently bound to an iron-oxide nanoparticle.

16. Implantable cardiac pacemaker comprising the motion sensor of claim 1-14, or means for receiving signals from an external motion sensor, and means for pacing a heart, as a response to the activity level as detected by the motion sensor, which means for pacing a heart is connected to said motion sensor.